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Mr Ng enjoys the culture of collaborative learning and innovation at DSTA. PHOTO: DSTA

Keeping cyber attacks at bay

A passion for engineering and defence technologies drives DSTA's Jason Ng

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NATIONS today need more than soldiers to defend their territory — they also need cyber warriors to thwart attacks on their virtual assets.

Mr Jason Ng Changwei is a cyber security engineer who works for the Defence Science and Technology Agency (DSTA) to strengthen and safeguard Singapore's defence systems from cyber threats.

As a manager in DSTA's Cybersecurity Programme Centre, he is responsible for developing innovative cyber security solutions for Singapore's defence systems, monitoring the IT networks and systems to detect any anomalies, as well as mounting a rapid response to keep threats and attacks at bay.

Gaining insights

Mr Ng's keen interest in how computers work and wireless communication led him to pursue a Bachelor of Engineering in Electrical and Electronic Engineering from Nanyang Technological University (NTU).

After he attained his degree, he joined DSTA's InfoComm Infrastructure Programme Centre in 2008 as a network engineer.

"While I was at NTU, I got to know more about DSTA and its job opportunities at a school career fair. After learning about DSTA's engineering capabilities, I was inspired to be part of their team that harnesses cutting-edge technology to deliver systems to meet the nation's defence and security needs," he recalls.

Mr Ng moved closer to his current specialisation while working on his final-year project in NTU, which involved the study of cryptography and its techniques.

Cryptography can be used to encrypt sensitive information to ensure data confidentiality and authenticity.

"I researched the signals of medical images and worked on improving the authenticity of these images.

The research process helped me to understand the fundamentals of cryptography, which is a rather important element in my work as a cyber security engineer," he adds.

After working for four-and-a-half years, Mr Ng took up the DSTA postgraduate scholarship to pursue a Master of Science in Information Technology (Information Security) from Carnegie Mellon University in the United States. He specialised in cyber forensics and incident response, with courses conducted by the university's renowned Computer Emergency Response Team.

"As part of my postgraduate studies, I also had the opportunity to do an internship at a start-up firm based in Silicon Valley, where I worked on advanced cyber analytics solutions and gained many insights and knowledge from the innovative entrepreneurs," he says.

He returned to DSTA in 2014 after completing his master's degree and joined its Cybersecurity Programme Centre.

Professional development

Mr Ng faces new challenges almost on a daily basis.

He explains: "We develop innovative techniques, programmes and algorithms in our laboratory to enable speedy collection, investigation and analysis of evidence.

"My team observes new cyber attack tactics to maintain a high level of preparedness.

"We then discuss and design new measures that we need to put in place to detect and respond to these cyber attacks."

Mr Ng enjoys the culture of collaborative learning and innovation at DSTA. There are also ample opportunities to experiment with leading-edge technologies, as well as develop and implement innovative ideas.

"The organisation encourages us to chart our individual career plans, together with our supervisors, through

a Personalised Career Development Plan. The plan takes into consideration our job aspirations, experiences and competencies, as well as the organisation's goals," he says.

Mr Ng has attended leadership courses, as well as systems engineering and management courses conducted by the DSTA Academy. He also attended other courses conducted by cyber security industry experts.

He cites the Cyber Defenders Discovery Camp 2016 as an enjoyable experience. Together with his colleagues, he planned and conducted the four-day camp to help students apply the concepts they had learned in the classroom in game scenarios in a simulated, real-world IT environment.

"The field of cyber security is dynamic and constantly evolving, with rogue cyber attackers developing new modus operandi every day to launch attacks, and various cyber defence techniques being developed at the same time to counter them," he says.

While keeping up to date with such trends and having the foresight to anticipate potential threats are important, Mr Ng believes that cyber security engineers must "possess a passion for engineering and defence technology, and continually strive for excellence and professionalism in their work".

"Ultimately, our innovative solutions and developments must enhance SAF's effectiveness and contribute to Singapore's defence," he adds.